UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/855,483	05/15/2001	Richard J. Tomaszewski	P01-3573	9601

22879	7590	01/12/2005

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EXAMINER
MCLEAN MAYO, KIMBERLY N

ART UNIT	PAPER NUMBER
2187	

DATE MAILED: 01/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

		Application No.	Applicant(s)
		09/855,483	TOMASZEWSKI ET AL.
Office Action Summary		Examiner	Art Unit
		Kimberly N. McLean-Mayo	2187

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 October 2004*.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
   closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4-7,10-12,14-16,18,19 and 27-47* is/are pending in the application.

   4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4-7,10-12,14-16,18,19,27-32 and 40* is/are rejected.

7)☒ Claim(s) *33-39 and 41-47* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   a)☐ All b)☐ Some * c)☐ None of:

   1.☐ Certified copies of the priority documents have been received.

   2.☐ Certified copies of the priority documents have been received in Application No. _____.

   3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
      application from the International Bureau (PCT Rule 17.2(a)).

   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
   Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____ .
5)☐ Notice of Informal Patent Application (PTO-152)
6)☐ Other: _____.

DETAILED ACTION

1.   The enclosed detailed action is in response to the Amendment submitted on October 14,

2004.

Claim Rejections - 35 USC § 103

2.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

3.   Claims 1-2, 4-6, 10-12, 14-16, 18-19, 27-32 and 40 are rejected under 35 U.S.C. 103(a)

as being unpatentable over Paterson et al. (USPN: 6,412,042) in view of DeKoning (USPN:

5,787,242) and Van Huben et al. (PGPUB: US 2002/0083299).

Regarding claim 1, Paterson discloses a plurality of concentric tracks defined on a disk (C 6, L

56-58); the disk including at least two data storage areas (Figure 7B, References 76,78), wherein

each area is sized to store a copy of a set of data and the data storage areas are substantially

equidistantly spaced from each other (C 7, L 17-19, L 39-44; Figure 7B illustrates the data

storage areas substantially equidistantly spaced from each other) and wherein all of the at least

two data storage areas are located within plus or minus one track of the same track (Figure 7B

illustrates the data storage areas within tracks which are adjacent each other) and a drive

mechanism coupled to the disk (Figure 1, Reference 10). Paterson does not disclose a controller

in communication with the drive mechanism for keeping track of deferred writes to the at least

two data storage areas of the disk thereby maintaining data coherency between the at least two

data storage areas. However, DeKoning teaches the concept of a controller in communication

with a drive mechanism for keeping track of deferred writes (pinned data) to data storage areas

of the disk, which maintains data coherency between the at least two data storage areas (C 5, L 1-

56). This feature taught by DeKoning saves data to be written to a disk storage area when the

storage area cannot be written to thereby ensuring accuracy [coherency] and proper operation of

the system. Hence, it would have been obvious to one of ordinary skill in the art to use

DeKoning's teachings with the system taught by Paterson for the desirable purpose of accuracy

and ensuring proper operation of the system in the event of failures. DeKoning does not

explicitly disclose a remote controller performing the above features. However, Van Huben

discloses the concept of a remote controller maintaining coherency between data storage areas.

This feature provides a means of improving general data accesses to a unified memory thereby

providing improved performance. Additionally, a remote controller provides increased

reliability by providing redundant functionality of a local controller. One of ordinary skill in the

art would have recognized the benefits of having a remote controller and would have been

motivated to add such a feature to the system taught by Paterson for the desirable purpose of

improved performance and increased reliability.

Regarding claim 2, Paterson discloses the at least two data storage areas are located at radially

opposed locations at a substantially 180 degree angular offset with respect to a spin axis (spin

axis of the spindle) of the rotating data storage disk and mirrored across the spin axis (Figure 7B

illustrates the data storage areas located at radially opposed locations, [with respect to the spindle

which is located at the center of the disk, refer to Figure 3], at a substantially 180 degree angular

offset, wherein the data storage areas are mirrored across the spin axis [the data storage areas are

mirrored across the spindle and thus are mirrored across the spin axis]).

Regarding claim 4, Paterson discloses the disk comprising at least two magnetic recording

surfaces (Figure 3, Reference 23 corresponding to each Reference 22), wherein the data storage

areas are formed in one of the at least two magnetic recording surfaces (C 7, L 46-48, L 50-52).

Regarding claim 5, Paterson discloses the disk further comprising at least two magnetic

recording surfaces (Figure 3, Reference 23 corresponding to each Reference 22), wherein the

data storage areas are formed in separate ones of the at least two magnetic recording surfaces

(Figure 7C, C 7, L 46-48, L 53-57, L 61-66).

Regarding claim 6, Paterson discloses the disk further comprising an optical recording surface (C

20, L 50-52; CD-ROMS are optical drives with optical recording surfaces).

Regarding claim 10, Paterson discloses the at least two data storage areas comprising a number

"n" of storage areas and the disk exhibiting a characteristic virtual revolutions per minute (RPM)

that is a multiple n of the actual spin speed of the rotating data storage disk (Figure 7B illustrates

the at least two data storage areas comprising two storage areas [References 76, 78] and

accordingly, since the data storage areas are mirrored at adjacent locations 180 degrees from

each other, the read latency is reduced 50 % and the virtual spin speed is 2x the actual spin

speed).

Regarding claim 11, Paterson discloses one or more platters, each platter supporting at least one

recording surface, wherein the platters are aligned about a common central axis (axis of the

spindle) (C 7, 59-60; C 6, L 36-42; Figure 3, References 22); a plurality of concentric tracks

defined on the platter (C 6, L 56-58); means for spinning the platters about the common central

axis (Figure 3, Reference 12; C 5, L 59-61); a recording head associated with each recording

surface (Figure 3, Reference 28; C 5, L 61-62; C 6, L 39); an actuator mechanism coupled to

each recording head (via Reference 26) to move the recording head into proximity with selected

portions of the recording surface in response to received commands (Figure 3, Reference 14; C

6, L 20-30); and at least two replicates of data stored in at least two data storage areas (Figure

7B, References 76, 78) such that any one of the at least two replicates can be accessed to service

a data access request (C 11, 36-52) and all of the at least two data storage areas are located

within plus or minus one track of the same track (Figure 7B illustrates References 76 and 78 as

adjacent to one another). Paterson does not disclose a controller for keeping track of deferred

writes to the data storage areas, thereby maintaining data coherency. However, DeKoning

teaches the concept of a controller for keeping track of deferred writes (pinned data) to data

storage areas of the disk, thereby maintaining data coherency (C 5, L 1-56). This feature taught

by DeKoning saves data to be written to a disk storage area when the storage area can not be

written to thereby ensuring accuracy [coherency] and proper operation of the system. Hence, it

would have been obvious to one of ordinary skill in the art to use DeKoning's teachings with the

system taught by Paterson for the desirable purpose of accuracy and ensuring proper operation of

the system in the event of failures. This feature taught by DeKoning saves data to be written to a

disk storage area when the storage area cannot be written to thereby ensuring accuracy

[coherency] and proper operation of the system. Hence, it would have been obvious to one of

ordinary skill in the art to use DeKoning's teachings with the system taught by Paterson for the

desirable purpose of accuracy and ensuring proper operation of the system in the event of

failures. DeKoning does not explicitly disclose a remote controller performing the above

features. However, Van Huben discloses the concept of a remote controller maintaining

coherency between data storage areas. This feature provides a means of improving general data

accesses to a unified memory thereby providing improved performance. Additionally, a remote

controller provides increased reliability by providing redundant functionality of a local

controller. One of ordinary skill in the art would have recognized the benefits of having a remote

controller and would have been motivated to add such a feature to the system taught by Paterson

for the desirable purpose of improved performance and increased reliability.

Regarding claim 12, Paterson discloses the data storage areas are located so as to be mirrored

about the spin axis of the platters (Figure 7B illustrates References 76 and 78 mirrored about the

spin axis of the platters).

Regarding claim 14, Paterson discloses the data storage areas formed in a single one of the one

or more platters (Figure 7B; C 7, L 46-48, L 50-52).

Regarding claim 15, Paterson discloses the data storage areas formed in separate platters of the

one or more platters (Figure 7C, C 7, L 46-48, L 53-57, L 61-66).

Regarding claim 16, Paterson discloses each recording surface comprising a plurality of

concentric tracks defined on the recording surface and each track is substantially aligned with a

corresponding track on an adjacent platter (Figure 3 illustrates the platters centered about the

spindle thereby substantially aligning the platters and the tracks of the platters), wherein all of

the at least two data storage areas are located on adjacent tracks (Figure 7B illustrates the at least

two data storage areas, References 76 and 78, on adjacent tracks).

Claim 18 is rejected for the same rationale applied to claim 10 above.

Regarding claim 19, Paterson discloses a command processor having an interface to receive

external disk access requests and coupled to provide the commands to the actuator mechanism

(Figure 8, Reference 82; the processor receives disk access requests from Reference 60 and the

processor provides commands to actuator, Reference 54); and memory coupled to the command

processor (Figure 8, Reference 80; C 8, L 7-11) and configured to store redundant write access

request commands such that the at least two replicates can be stored asynchronously (C 11, L 64-

66; C 12, L 8-14; Figure 12, Reference 142 and 148 – the data corresponding to the write request

is duplicated in the memory, wherein the write data and the duplicated write data are effectively

executed as a write command and a duplicated (redundant) write command when the write data

and the duplicated write data are removed from the memory and thus the write data and the

duplicate (redundant) write data stored in the memory represent the write command and the

redundant write command respectively).

Regarding claim 27, Paterson discloses a disk controller (Figure 4, Reference 56) in

communication with a disk comprising a command port for receiving access request (signal line

coupled between References 56 and 60 in Figure 4; C 6, L 50-55); a command processor for

executing software processes (instructions stored in ROM, Reference 84, in Figure 8)(Figure 8,

Reference 82; C 8, L 11-17); a first process executing in the command processor for replicating a

received disk access request, wherein the first process generates a replicated access request that

refers to a track adjacent to a track referred to by the access request (instructions stored in ROM,

[Reference 84, Figure 8], which perform the features described in C 11, L 39-41, C 11, L 67; C

12, L 1–5, L 8-10; Figure 12, Reference 148 for a disk which is setup as shown in Figure 7B,

wherein the two data storage areas are located adjacently, References 76 and 78 are located in

adjacent tracks); a second process executing in the command processor for executing at least one

of the received disk access request and replicated disk access request against a disk drive

(instructions in ROM (84) which perform the features described in Figure 12, References 146

and 150; C 12, L 5-8, L 10-14). Paterson does not disclose means for keeping track of deferred

writes to the disk, which thereby maintains data coherency. However, DeKoning discloses

means for keeping track of deferred writes to the disk, thereby maintaining data coherency (C 5,

L 1-56). This feature taught by DeKoning saves data to be written to a disk storage area when

the storage area is not able to be written to thereby ensuring accuracy and proper operation of the

system. Hence, it would have been obvious to one of ordinary skill in the art to use DeKoning's

teachings with the system taught by Paterson for the desirable purpose of accuracy and ensuring

proper operation of the system in the event of failures.

Regarding claims 28-29, Paterson discloses the first process comprises causing the processor to

determine radially opposed locations within the disk and to determine adjacent tracks within the

disk suitable for the disk access request (C 11, L 67; C 12, L 1–5; referring to Figure 7B, the data

locations within the disk are located at radially opposed locations and are located on adjacent

tracks and thus when the processor determines locations [Figure 7B, References 76, 78] suitable

for the disk access request from the lookup table, the processor intrinsically determines locations

at radially opposed locations within the disks and locations located on adjacent tracks).

Regarding claim 30, Paterson discloses the second process receiving the determined radially

opposed locations and executes the at least one disk access request at the determined location (C

12, L 5-8, L 10-14 – the second process writes data to the data locations and thus it is evident

that the second process receives the locations).

Regarding claim 31, Paterson discloses a redundant data table (locations within Reference 80 in

Figure 8 where the duplicated data is stored) holding one or more pending write access requests

(C 12, L 8-10 - Reference 80 stores duplicated write data, the duplicated write data is executed as

a write command when removed from the memory and therefore also represents the write

command) and coupled to the second process (via Reference 82 in Figure 8) such that the second

process can execute the received disk access request and the replicated disk access request

asynchronously (C 12, L 5-8, L 10-14).

Regarding claims 32 and 40, Paterson discloses an integrated controller that manages data

storage operations of the disk drive (Figure 4, Reference 56).

4.   Claims 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Paterson et al.

(USPN: 6,412,042) in view of DeKoning (USPN: 5,787,242) as applied to claim 1 above and

further in view of Takahashi et al. (USPN: 5,707,727).

Paterson and DeKoning disclose the limitations cited above, however, Paterson and DeKoning

do not explicitly disclose the disk further comprising a magneto-optical recording surface.

Takahashi discloses the use of a magneto-optical recording surface (Abstract) as a recording

method that provides a large capacity memory (C 2, L 35-38). Paterson teaches that the

invention is applicable to other storage media (C 20, L 50-52) and hence it would have been

obvious to one of ordinary skill in the art to use a magneto-optical disk drive in the system taught

by Paterson for the desirable purpose of providing a large capacity memory.

Allowable Subject Matter

5.   Claims 33-39 and 41-47 are objected to as being dependent upon a rejected base claim,

but would be allowable if rewritten in independent form including all of the limitations of the

base claim and any intervening claims.

Response to Arguments

6.   Applicant's arguments filed have been fully considered but they are not persuasive.

In response to Applicant's arguments regarding DeKoning, it should be noted initially that the

above rejection is a 35 U.S.C. 103 rejection. The Applicant has presented arguments relevant to

a 102 rejection. The combination of the prior art relied upon in a 103 rejection should teach the

claimed invention. Paterson discloses a controller, however, the controller is not remote and

does not keep track of deferred writes to the storage areas of the disk. DeKoning is relied upon

for keeping track of deferred writes to storage areas of a disk (RAID device), which maintains

data coherency by ensuring accuracy in the event of a failure and thus a 103 rejection does not

require DeKoning to also teach a remote controller. Van Huben is relied upon for teaching a

remote controller and again the doctrine of an obviousness type rejection does not require Van

Huben to teach the other features. However, what is required is that the combination of the

references must teach the claimed invention. This burden has been met as illustrated in the

above rejection. The test for obviousness is not whether the features of a secondary reference

may be bodily incorporated into the structure of the primary reference; nor is it that the claimed

invention must be expressly suggested in any one or all of the references. Rather, the test is what

the combined teachings of the references would have suggested to those of ordinary skill in the

art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

Conclusion

7.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time

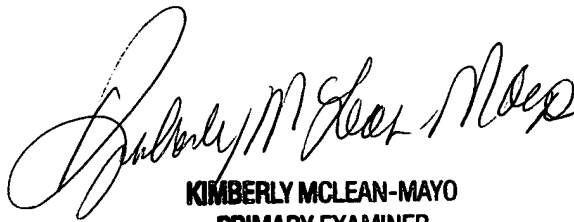policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the mailing

date of this final action.

8.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Kimberly N. McLean-Mayo whose telephone number is 703-308-

9592. The examiner can normally be reached on M-F (9:00 - 6:30) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Donald Sparks can be reached on 703-308-1756. The fax phone number for the

organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kimberly N. McLean-Mayo
Examiner
Art Unit 2187

KIMBERLY MCLEAN-MAYO
PRIMARY EXAMINER

KNM

January 9, 2005